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NOTICE OF ALLOWANCE AND FEE(S) DUE

1609 7590 04/09/2010

ROYLANCE, ABRAMS, BERDO & GOODMAN, L.L.P.
1300 19TH STREET, N.W.
SUITE 600
WASHINGTON,, DC 20036

EXAMINER

HOQUE, FARHANA AKHTER

ART UNIT

PAPER NUMBER

2831

DATE MAILED: 04/09/2010

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/591,528

08/24/2007

Timothy J. Fawcett

52391

2963

TITLE OF INVENTION: METHOD AND APPARATUS FOR CHARACTERISING A THREE PHASE TRANSFORMER USING A SINGLE PHASE POWER SUPPLY

| APPLN. TYPE | SMALL ENTITY | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|----------------|--------------|---------------|---------------------|----------------------|------------------|------------|
| nonprovisional | NO | \$1510 | \$300 | \$0 | \$1810 | 07/09/2010 |

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

1609 7590 04/09/2010
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1300 19TH STREET, N.W.
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Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

| |
|--------------------|
| (Depositor's name) |
| (Signature) |
| (Date) |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/591,528 08/24/2007 Timothy J. Fawcett 52391 2963

TITLE OF INVENTION: METHOD AND APPARATUS FOR CHARACTERISING A THREE PHASE TRANSFORMER USING A SINGLE PHASE POWER SUPPLY

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| nonprovisional | NO | \$1510 | \$300 | \$0 | \$1810 | 07/09/2010 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|-----------------------|----------|----------------|
| HOQUE, FARHANA AKHTER | 2831 | 324-726000 |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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| 10/591,528 | 08/24/2007 | Timothy J. Fawcett | 52391 | 2963 |
| 1609 | 7590 | 04/09/2010 | EXAMINER | |
| ROYLANCE, ABRAMS, BERDO & GOODMAN, L.L.P. 1300 19TH STREET, N.W. SUITE 600 WASHINGTON,, DC 20036 | | | HOQUE, FARHANA AKHTER | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2831 | |
| DATE MAILED: 04/09/2010 | | | | |

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 292 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 292 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability

Application No.

10/591,528

Examiner

FARHANA HOQUE

Applicant(s)

FAWCETT, TIMOTHY J.

Art Unit

2831

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 3/24/2010.
2. ☒ The allowed claim(s) is/are 1-14 and 16-18.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Stacey Longanecker on 4/6/2010.

Change claim 12, line 22, "subtracting" to - - subtracting - -;

Reasons for Allowance

2. Claims 1-14 and 16-18 are allowed.
3. The following is an examiner's statement for reasons for allowance:

With regard to claim 1, the prior art does not teach, suggest or render the obvious the claimed structure of "a method of characterising a three phase transformer having three input terminals and three output terminals using a single phase power supply, the method comprising the steps of:

sequentially connecting the single phase power supply between all three available pairs of input terminals selected from the three input terminals of the transformer so as to energise each available pair of input terminals in turn;

during energisation of each pair of terminals measuring the voltage between all three available pairs of output terminals selected from the three output terminals of the transformer; and processing the measured voltages to determine therefrom which one

Art Unit: 2831

of a plurality of winding configurations the transformer has in order to characterise the transformer even when its winding configuration is unknown.”

Claim 4 is considered to be allowable due to the inclusion of claim limitation: “a three phase transformer having three input terminals and three output terminals using a single phase power supply, the method comprising the steps of: sequentially connecting the single phase power supply between all three available pairs of input terminals selected from the three input terminals of the transformer so as to energise each available pair of input terminals in turn; during energisation of each pair of terminals measuring the voltage between all three available pairs of output terminals selected from the three output terminals of the transformer; and processing the measured voltages to characterise the transformer; wherein the three voltages measured during energisation of each pair of input terminals are processed to identify the highest, lowest and intermediate value and the difference between the intermediate value less the lowest value computed and then divided by the highest value to produce three figures of merit, one associated with energisation of each pair of input terminals.”

Claim 10 is considered to be allowable due to the inclusion of claim limitation “sequentially connecting the single phase power supply between all three available pairs of input terminals selected from the three input terminals of the transformer so as to energise each available pair of input terminals in turn; during energisation of each pair of terminals measuring the voltage between all three available pairs of output terminals selected from the three output terminals of the

Art Unit: 2831

transformer; and processing the measured voltages to characterise the transformer; wherein the transformer is characterised according to the presence of neutrals on its primary and/or secondary side; and wherein the transformer has three input terminals H1, H2 and H3 and an input neutral terminal HO and three output terminals X1, X2 and X3 and an output neutral XO and when the single phase power supply is connected between input terminals H1 and H3 the highest voltage measured between output terminals X1 and X3, X2 and X1 and X3 and X2 is saved (X_{pp}) and the highest voltage measured between X1 and XO, X2 and XO and X3 and XO is saved (X_{pn}) and further comprising the step of connecting the single phase power supply between H1 and HO, measuring the voltages between X1 and X3, X2 and X1, and X3 and X2, saving the highest value (X_{pn}) and determining the ratios of the first saved voltage with each of the second and third saved voltages respectively (X_{pn}/X_{pp} and X_{np}/X_{pp}) thereby to determine the presence of neutrals on the primary and/or secondary side of the transformer.”

Claim 12 is considered to be allowable due to the inclusion of claim limitation: “sequentially connecting the single phase power supply between all three available pairs of input terminals selected from the three input terminals of the transformer so as to energise each available pair of input terminals in turn; during energisation of each pair of terminals measuring the voltage between all three available pairs of output terminals selected from the three output terminals of the transformer; and processing the measured voltages to characterise the transformer, the measured voltages being processed to characterise the transformer according to its

Art Unit: 2831

winding configuration, and the transformer is classified as D-D equivalent, D-Y equivalent, Y-D equivalent or Y-Y equivalent; wherein the phase displacement of the transformer is calculated by the following steps: determining if the primary and secondary winding configurations are similar and if not allocating a value of 1, otherwise allocating a value of 0; determining a configuration result factor and adding a value according to the configuration result factor to the value allocated in the previous step; determining if the secondary winding of the transformer windings is reversed and if not adding 6 to the value calculated in the previous step, otherwise leaving the value unaltered; and if the value is greater than 12 subtracting 12, otherwise leaving the value unaltered, thereby to determine the phase displacement of the transformer.

Claim 16 is considered to be allowable due to the inclusion of claim limitation: "means for selectively applying power from said power supply to pairs of input terminals of a three phase transformer; means for measuring the voltage between pairs of output terminals of a three phase transformer; and a control means comprising a processing means, said control means being operative to control said power supply, means for measuring voltages and processing means to process the measured voltages to determine which one of a plurality of winding configurations the transformer has thereby to characterise a transformer even when its winding configuration is unknown.

Claims 2, 3 and 9 are considered to be allowable due to their dependency on allowable claim 1; claim 5 is considered to be allowable due to its dependency on allowable claim 4; claims 6 and 7 are considered to be allowable due to its dependency on allowable claim 5; claim 8 is considered to be allowable due to its dependency on

Art Unit: 2831

allowable claim 7; claim 11 is considered to be allowable due to its dependency on allowable claim 10; claims 13 and 14 are considered to be allowable due to its dependency on allowable claim 12; claims 17 and 18 are considered to be allowable due to its dependency on allowable claim 16.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FARHANA HOQUE whose telephone number is (571)270-7543. The examiner can normally be reached on Monday - Friday 8:30-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on (571) 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2831

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/FARHANA HOQUE/
Examiner, Art Unit 2831

/Timothy J. Dole/
Primary Examiner, Art Unit 2831